

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
10 February 2005 (10.02.2005)

PCT

(10) International Publication Number
WO 2005/011753 A1

(51) International Patent Classification⁷: **A61L 2/10**,
B01D 53/00, C02F 1/32, A61L 2/18

(21) International Application Number:
PCT/IL2004/000717

(22) International Filing Date: 4 August 2004 (04.08.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
157229 4 August 2003 (04.08.2003) IL

(71) Applicant (for all designated States except US): **AT-LANTIUM LASERS LIMITED [CY/CY]**; 4 Makarios III Av., Capital Center, 9th floor, Nicosia (CY).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **TRIBELSKY, Zamir** [IL/IL]; 12/4 Duchiphat Ave., 90805 Mevaseret Zion (IL).

(74) Agent: **REINHOLD COHN AND PARTNERS**; P.O.B. 4060, 61040 Tel Aviv (IL).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

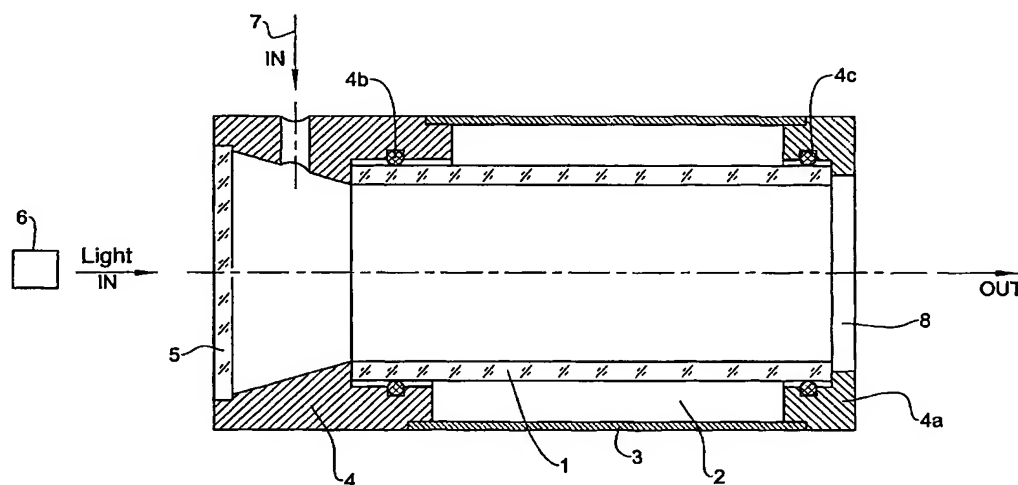
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **IN-LINE TREATMENT OF LIQUIDS AND GASES BY LIGHT IRRADIATION**



(57) Abstract: An in-line reactor for the treatment of liquids or gasses by light radiation is disclosed. The reactor is made of tube, pipe, or chamber made of a transparent material, having at least one fluid inlet and correspondingly at least one fluid outlet. The transparent material of the tube is selected such that its refractive index is as possible close to the refractive index of the fluid to be treated. Air gap is kept around the outer transparent walls of the reactor, in order to allow for total internal reflection inside the reactor, of light directed into it from a light source in angles of incidence greater than the critical angle. Fluid treatment systems comprising at least one said in-line reactor are also disclosed. Furthermore, method of in-line fluid treatment, and especially of water sterilization and disinfection and aseptic filling of water are disclosed. Surfaces hit by the in-line disinfected water after being launched through an outlet nozzle, could also be sterilized by launching the water with the same UV light used for the in-line treatment locked in total internal reflection within the free flow water jet.